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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,651

02/25/2005

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EXAMINER

HAN, KWANG S

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/525,651	Applicant(s) KIMURA ET AL.	
	Examiner Kwang Han	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☒ Claim(s) 11-24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2/25/05, 6/08/06, 08/02/06, 09/14/06</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement filed 2/25/2005, 6/08/2006, and 8/2/2006 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

Specification

3. The disclosure is objected to because of the following informalities: On pages 8-10 of the specifications it states a "potable information device", it is suggested that the statement should read "portable information device".

Appropriate correction is required.

Claim Objections

4. Claims 11-24 objected to because of the following informalities: The word "potable" should be "portable". Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 3, 5, 6, 7, 11, 13-17, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. (JP 2002-231290, as cited in IDS, online translation) in view of Takahashi (JP 08-287941, as cited in IDS, online translation).

Hatanaka et al. is directed to a fuel cell (32) comprised of the following:

- a fuel electrode [0003],
- an oxidant electrode [0003], and

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- generates electric power based on a supply of organic liquid fuel

[Abstract].

Hatanaka discloses carbon dioxide which is emitted as a by-product of power generation and adheres to the fuel electrode [0026] which is removed with the use of convection [0027] but is silent towards the use of a vibration generating unit.

Takahashi teaches electrode plates which form bubbles during charging that are adhered to the surface of the electrode which are removed with the use of a vibration generating unit to remove gas bubbles which form on an electrode for the benefit of quickly removing them to reduce electrical resistance[Abstract].

Hatanaka and Takashi are analogous art because they are both concerned with removing bubbles from the surface of an electrode.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Takahashi's vibration unit in Hatanaka's fuel electrode for the benefit of quickly removing adhered gas bubbles using vibration to reduce blockage and increase flow of fuel to the electrode.

Regarding claim 3, the teachings of Hatanaka and Takahashi as discussed above are herein incorporated. Takahashi further discloses the use of a power applying unit (actuation current feed means, 15) [0036] which provides alternating electric power [0022] to allow the vibration generating unit to oscillate.

Regarding claim 5, Takahashi further discloses a vibration generating unit comprised of a piezoelectric vibrator [0022].

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Regarding claim 6, the teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Hatanaka et al. is silent as to the placement of a vibration generating unit arranged on the fuel cell main unit.

Takahashi teaches the placement of the vibration generating unit within the main power generating unit for the benefit of providing direct vibration to the electrodes [0033].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to place the vibration generating unit on the fuel cell main unit because it would provide direct vibration to the electrodes to remove the evolved gases.

Regarding claim 7, the teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Hatanaka et al. is silent as to the use of a holding substrate.

Takahashi teaches the use of a substrate (battery casing, Drawing 5) [0033] for the benefit of transferring vibrations to the power generating unit.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Takahashi's holding substrate in Hatanaka et al. fuel cell for the benefit of provide a medium to directly transfer the vibrations to the electrode.

Regarding claim 11, the teachings of Hatanaka and Takahashi as discussed above are herein incorporated. Hatanaka et al. is further directed towards a portable

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information device [0001] comprising a body (20) and a fuel cell which is arranged in said body (10) [Abstract].

Regarding claim 13, the applicant is directed toward the discussion concerning claim 3.

Regarding claim 14, the applicant is directed toward the discussion concerning claim 4

Regarding claim 15, the applicant is directed toward the discussion concerning claim 5.

Regarding claim 16, the applicant is directed toward the discussion concerning claim 6.

Regarding claim 17, the applicant is directed toward the discussion concerning claim 7.

Regarding claim 26, Hatanaka is directed towards an operation method of a fuel cell comprised of the following:

- generating electric power by supplying organic liquid fuel to a fuel electrode [0021], and
- oxidant to an oxidant electrode [0023].

Hatanaka discloses carbon dioxide which is emitted as a by-product of power generation and adheres to the fuel electrode [0026] which is removed with the use of convection [0027] but is silent towards the method of vibration.

Takahashi teaches electrode plates which form bubbles during charging that are adhered to the surface of the electrode which are removed with the use of a vibration

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generating unit to remove gas bubbles which form on an electrode for the benefit of quickly removing them [Abstract].

Hatanaka and Takahasi are analogous art because they are both concerned with removing bubbles from the surface of an electrode.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Takahashi's vibration method in Hatanaka's fuel electrode for the benefit of quickly removing adhered gas bubbles.

Regarding claim 27, the teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Takahashi further discloses the use of a power applying unit (actuation current feed means, 15) [0036] which provides alternating electric power [0022] to allow the vibration generating unit comprised of a piezoelectric vibrator [0022] to oscillate.

Claims 4 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. in view of Takahashi as applied to claims 1 and 26 above, and further in view of Lehman et al. (US 5879826).

Regarding claims 4 and 28, the teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Hatanaka et al. and Takahashi are silent as to an output of the fuel cell powering the vibration generating unit.

Lehman et al. teaches auxiliary devices (parasitic loads) of the fuel cell which are driven by the output of the fuel cell main unit for the benefit of supporting the functioning of the fuel cell (Column 2, Lines 44-54; Column).

It would have been obvious to one of ordinary skill in the art at the time of the invention to power the vibration generating unit of Hatanaka modified by Takahashi by an output of the fuel cell because it supports the functioning of the fuel cell as taught by Lehman and is more compact without the need of external power supplies for the vibration generating unit.

9. Claims 2, 8, 9, 12, 18, 19, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. in view of Takahashi as applied to claim 1, 11, and 26 above, and further in view of Gyoten et al. (US 6117579).

Regarding claim 2, the teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Hatanaka and Takahashi are silent as to the use of a control unit which controls the operation of a vibration generating unit based on the output of the fuel cell.

Gyoten et al. teaches the use of a control unit which controls a vibration device and produces vibration intermittently or based on the output of a fuel cell to improve performance by removing blockage in the gas channels or the pores of an electrode (Column 3, Lines 38-48; Claim 14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Gyoten's control unit to control the vibration generating unit in the fuel cell of Hatanaka modified by Takahashi for the benefit of intermittently vibrating the device to improve performance in the fuel cell when deterioration of fuel cell performance is detected.

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Regarding claims 8 and 9, the teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Hatanaka and Takahashi are silent as to a porous separator having a hydrophilic or hydrophobic coating material.

Gyoten et al. teaches the use of a porous current collector with a porous electrode layer composed of a hydrophilic material with random additions of hydrophobic finish to provide channeling and easy removal of water within the electrodes (Column 2, Lines 41-48; Column 2, Line 56 – Column 3, Line 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Gyoten's electrode layer with hydrophilic and hydrophobic regions in Hatanaka modified by Takahashi's porous separator for the benefit of providing channeling and easy removal of water from the electrode.

Regarding claim 12, the applicant is directed towards the discussion concerning claim 2.

Regarding claims 18 and 19, the applicant is directed towards the discussion concerning claims 8 and 9.

Regarding claim 29, the teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Hatanaka et al. and Takahashi are silent as to the vibrating the fuel electrode when the output of the fuel cell is lower than a threshold.

Gyoten et al. teaches the use of a control unit which controls a vibration device and produces vibration intermittently or based on the output of a fuel cell to improve

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performance by removing blockage in the gas channels or the pores of an electrode (Column 3, Lines 38-48; Claim 14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Gyoten's control unit to vibrate the fuel electrode of Hatanaka modified by Takahashi when the output is lower than a threshold value for maintaining the fuel cell performance by using feedback.

10. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. in view of Takahashi as applied to claim 1 and 11 above, and further in view of Maricle et al. (US 4125676).

Regarding claims 10 and 20, the teachings of Hatanaka et al., and Takahashi as discussed above are herein incorporated. Hatanaka and Takahashi are silent as to the use of a current collector with holes at a side of the fuel electrode catalyst layer which are smaller than those on the opposite side.

Maricle et al. teaches a current collector (110), fuel electrode catalyst layers (104) in contact with the electrolyte layer (108) and further teaches layers adjacent to the current collector which are comprised of thick large pore layers adjacent to the separator and thinner smaller pore layers adjacent to the catalyst layer to provide free flow of a reactant gas yet still maintain separation (Column 6, Lines 23-44).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have Maricle's current collector with differing pore layers in Hatanaka

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modified by Takahashi's fuel cell for the benefit of providing free flow of reactant gas to the catalyst layer yet maintaining separation.

11. Claims 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. in view of Takahashi as applied to claim 11 above, and further in view of Tanaka et al. (US 2002/0187380) and Kitamura et al. (US 4883717).

The teachings of Hatanaka et al. and Takahashi as discussed above are herein incorporated. Hatanaka and Takahashi are silent towards the use of an inner and outer body with a vibration damping material which connects the two bodies.

Tanaka et al. teaches the use of an outer body (10, housing case) and an inner body (52, fuel cell stack) which is contained in the outer body and connected to each other by way of mounts (86, 88) for the benefit of preventing positional deviation from vibration and deformation [0059] by isolating a section of the fuel cell stack to the outer housing but is silent towards the mounts being composed of a vibration dampening material such as butyl rubber.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Tanaka's inner and outer body with mounts in Hatanaka modified by Takahashi's fuel cell powered device for the benefit of preventing positional deviation from vibration and deformation.

Kitamura et al. teaches vibration dampening between one part to another with the use of butyl based material (Column 6, Lines 23-24) which is interposed between two plates (Column 2, Lines 17-23) for the benefit of workability and increased vibration-damping ability to isolate the vibration.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Kitamura's butyl based material in Hatanaka modified by Takahashi and Tanaka's fuel cell mounts between the inner and outer body for the benefit of dampening and isolating vibration of the electrodes of the fuel cell from the rest of the device to minimize positional deviation and deformation.

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. in view of Takahashi, Tanaka et al., and Kitamura et al. as applied to claim 21 above, and further in view of Little (US 5642413).

The teachings of Hatanaka et al., Takahashi, Tanaka et al., and Kitamura et al. as discussed above are herein incorporated. Modified Hatanaka is silent as to an information notifying unit which transmits vibrations. Hatanaka et al. further teaches a fuel cell system which is used as a power supply for portable electronic devices such as cell phones [0001].

Little teaches the use of an information notifying unit (16) which is arranged in a inner body (28) which transmits vibration to an outer body (14) (Column 4, Lines 27-40) for the benefit of alerting a user to a call [Abstract].

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Little's information notifying unit in the portable electronic device of modified Hatanaka for the benefit of providing notification to a user by way of vibration.

13. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. in view of Takahashi as applied to claim 11 above, and further in view of Little.

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Regarding claim 23, the teachings of Hatanaka et al. modified by Takahashi as discussed above are herein incorporated. Modified Hatanaka is silent as to an information notifying unit which transmits vibrations. Hatanaka et al. further teaches a fuel cell system which is used as a power supply for portable electronic devices such as cell phones [0001].

Little teaches the use of an information notifying unit (16) which is arranged in a inner body (28) which transmits vibration to an outer body (14) (Column 4, Lines 27-40) for the benefit of alerting a user to a call [Abstract].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Little's information notifying unit as the vibration generating unit in Hatanaka modified by Takahashi's portable information device because it provides vibration to notify the user of an event and can quickly remove evolved gases off an electrode as taught by Takahashi.

Regarding claim 25, the teachings of Hatanaka et al., Takahashi, and Little as discussed above are herein incorporated. Little is further directed towards a cell phone comprised of a body (14; Figure 1). The applicant is directed specifically to discussion concerning claims 1 and 23.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./

Examiner, Art Unit 1795

/Susy Tsang-Foster/

Supervisory Patent Examiner, Art Unit 1795